

LESSON PLAN

**PART I
COVER SHEET**

LESSON TITLE: Camouflage, Concealment, and Deception Planning and Implementation

TRAINING METHOD: Lecture - Discussion

ORGANIZATIONAL PATTERN: Sequential

- REFERENCES:**
1. AFI 32-4007, *Camouflage, Concealment, and Deception*
 2. JCCD Technical Report 94-1, *Air Base Camouflage, Concealment, and Deception Guide*
 3. *A Guide to Bare Base Camouflage in a Desert Environment*
 4. FM 3-101-1, *Smoke Squad/Platoon Operations*
 5. FM 3-100, *NBC Defense, Chemical Warfare, Smoke, and Flame Operations*
 6. FM 90-2, *Battlefield Deception*
 7. Joint Pub 3-58, *Joint Doctrine for Military Deception*

AIDS AND HANDOUTS: Attachment 1: Threat Sensors Defeat with Camouflage, Concealment, and Deception (CCD)

Attachment 2: Five Step Process for Integrating Camouflage, Concealment, and Deception into Other Plans

Attachment 3: Camouflage, Concealment, and Deception Installation Site Survey Checklist

Attachment 4: Camouflage, Concealment, and Deception Base Evaluation Checklist

LESSON OBJECTIVE: Students should be thoroughly familiar with all aspects necessary to provide effective input to the unit, base, and MAJCOM level CCD plans. Students must master at least five of the seven samples of behavior to complete this course of instruction.

SAMPLES OF BEHAVIOR:

1. Identify CCD design priorities.
2. Identify necessary data to be collected for a successful CCD plan.
3. Identify proper CCD construction planning techniques.
4. Identify CCD plan implementation and coordination considerations.
5. Identify probable air base targets.
6. Identify factors of conspicuousness for potential targets.
7. Determine correct use of specific CCD applications.

SUGGESTED COURSE(S) OF INSTRUCTION: CCD Planners Course

STRATEGY: This lesson should be the final lesson in the sequence of the lessons in the K-block of training packages as necessary to meet the threat. Instructors may add other RTP's to this list. Ideally, instructors should give students a practical exercise as part of the planning process. Construct these exercises locally to meet individual base needs. ***The attached checklists may assist you in developing this exercise.*** Also, color photographs concerning CCD are now available on CD-ROM from the Air Force Electronic Publishing Library (AFEPL).

LESSON OUTLINE:

- MAIN POINT 1.** General CCD concepts
- a. Systematic approach
 - b. CCD point of contact
 - c. CCD goal
 - d. CCD design
- MAIN POINT 2.** Deception factors
- a. Secrecy and organization
 - b. Reasonable and confirmable
 - c. Adaptable
 - d. Timing and intensity
 - e. Enemy inclination
 - a. Initiative
- MAIN POINT 3.** Collecting and evaluating data
- a. Determine the threat
 - b. Establish CCD plan with clear goals
 - c. Identify and establish likely targets
 - d. Prioritize targets
 - e. Use exercise information
 - f. Examine air base and surrounding areas
 - g. Collect maps and photos of base and surrounding area
- MAIN POINT 4.** Probable targets
- MAIN POINT 5.** Conspicuity factors
- a. Roads are good orientation features
 - b. Size
 - c. Shape
 - d. Pattern
 - e. Thermal contrast
 - f. Radar reflection
- MAIN POINT 6.** Non-specific CCD measures
- a. Smoke and obscurants
 - b. Forestation
 - c. Decoy aircraft

- MAIN POINT 7. Specific CCD measures
- a. Runways and taxiways
 - b. Tonedown
 - c. Nets and water
 - d. Shelters
 - e. Communications and analysis center
 - f. Weapons storage
 - g. POL storage
 - h. Maintenance hangars
 - i. Warehouse complex
 - j. Administration buildings
- MAIN POINT 8. Plan development
- a. Integrate obscurants
 - b. Planning group forum
 - c. Evolving threats
 - d. Evaluate CCD successes
- MAIN POINT 9. Plan coordination and implementation
- a. CCD Scheduling
 - b. Coordinate CCD
 - c. Construction control
 - d. Inspections
 - e. Aerial multispectral analysis

PART II
TEACHING PLAN
INTRODUCTION

ATTENTION:

Deception is the art of misleading our enemies to do what we want them to do, rather than what they had originally intended to do. The false information we provide must be realistic and plausible.

MOTIVATION:

The CCD plans you help develop could save your base from losing its most precious assets while in a hostile environment.

OVERVIEW:

In this lesson we will discuss:

- CCD concepts and deception prerequisites
- How to collect and evaluate data
- Probable targets and their conspicuousness
- Specific and non-specific CCD measures
- How to develop, coordinate, and implement CCD plans

TRANSITION:

Let's begin with the general CCD concepts.

BODY**MAIN POINT 1.
GENERAL CCD
CONCEPTS**

Time after time tests prove CCD reduces enemy firepower effectiveness and confuses their orientation on the installation. CCD also prevents the attacker from effectively selecting critical targets.

**a. SYSTEMATIC
APPROACH**

There are few “canned” answers to CCD problems, instead we want to concentrate on the systematic approach which forms a basis for effective CCD solutions. We’ll emphasize this approach as we develop an overall deception strategy for a hypothetical air base.

**- WHAT DO YOU
WANT THE THREAT
TO DO**

CCD planners develop this strategy by asking the question; “What do we want the enemy threat to do?” Keep this question in mind as we learn CCD planning and implementation.

INSTRUCTORS NOTE: REFER AS NECESSARY, TO ATTACHMENT 2, THE FIVE STEP PROCESS FOR INTEGRATING CCD INTO OTHER PLANS
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b. CCD POINT OF
CONTACT

Maximizing the effectiveness of any CCD problem's potential solution with the least practical effort and resources requires more than just a quick look at a CCD problem. Essentially, each base commander designates and provides a person with authority as a CCD focus or point of contact.

CCD ACTIVITIES
CONCERTED AND
PROPERLY MANAGED

This contact point ensures CCD-related activities are concerted, properly managed, and integrated into the base or units war fighting capability. CCD program effectiveness varies greatly between bases and between facilities at each installation.

c. CCD GOAL:
CONTROL THREAT
FOR MAXIMUM
SURVIVAL

The overall goal of CCD is to make the enemy threat do whatever you want them to do against their best interests and enhance your installation's maximum survivability.

INSTRUCTORS NOTE: ATTACHMENT 1 PROVIDES WAYS TO DEFEAT CERTAIN THREAT SENSORS WITH VARIOUS CCD MEASURES.
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**LEVEL OF CCD
REQUIRED CHANGES
WITH THREAT**

The amount of CCD we need to defeat a specific threat changes with the character of that threat, our individual assets or structures and their location, and surrounding terrain. Other factors include the season, time-of-day, and the threat approach, weapons, sensors, and attack profiles.

d. CCD DESIGN**REDUCE THREAT
EFFECTIVENESS WITH
MINIMUM RESOURCES**

When we discuss CCD designs, our goal is to reduce the threats effectiveness and provide the level of survivability we desire. We must not interfere with other base warfighting operations, therefore, our CCD measures should use the minimum practical funding, resources, and manpower.

**EMPHASIS ON
INCREASED
SURVIVABILITY**

Design procedures we use should systematically consider what targets are conspicuous or obvious, why, and how to best reduce this conspicuity. Emphasize achieving the desired protection and survivability for the least amount of CCD resources employed in terms of personnel, equipment, time, etc.

**DIRECT EFFORTS
TOWARD MOST
CRITICAL TARGETS
AND CUES**

The effort we give our CCD design comes in various degrees and falls in priority sequence depending on the needs of each installation.

DESIGN CONSIDERATIONS

Remember throughout your effort that CCD on one target must not make another priority target more conspicuous. However, keep in mind that one of your objectives may be to highlight a low value target in order to downplay a higher priority target. This is the exception to the rule.

FIRST PRIORITY

According to the War and Mobilization Plan, 1995, our first priority is to protect the most critical high-value targets and their cues.

SECOND PRIORITY

Our second priority should include protecting large or very conspicuous features that allow the attacker to identify the base. Runways or large buildings are perfect examples.

MAIN POINT 2.

For a CCD planner to be effective in creating a plan to deceive the adversary, certain factors must be considered. The first factor is secrecy and organization.

a. SECRECY AND ORGANIZATION

Secrecy is of utmost importance to our CCD efforts. The measures we use to deceive our opponents must be kept as close-hold information, and applied in a well-planned and organized fashion. If CCD is applied too early, unintentional leaks may unravel the deception scheme.

**VALIDATE THE NEED-
TO-KNOW**

Only people with a validated need-to-know why and how we employ CCD measures should have access to this information.

Organizational CCD planners and trainers and the command staff require this information to make appropriate decisions for the unit's mission. However, personnel employing the CCD measures (the user's) may not necessarily have a need-to-know why, just how. For this reason, unit checklists implementing the base CCD plan may need to be classified.

**b. REASONABLE AND
CONFIRMABLE**

The plan we use must be reasonable and the enemy must be able to confirm it through multiple sources such as human intelligence, satellite and photo reconnaissance, electromagnetic spectrum analysis instruments, and cues to the target areas. Be ingenious with the actions you develop in support of your overall plan.

c. ADAPTABLE

Your CCD plan must adapt to the area's climate, environment, and seasonal conditions. Other considerations include changes to the mission and evolving threats. Be dynamic and flexible enough with the plan to remain believable.

**d. TIMING AND
INTENSITY**

CCD measures applied too early or late, too long or not long enough, or with too much emphasis, can all cause your well-planned CCD measures to be less effective than intended.

e. ENEMY
INCLINATION

Exploit your opponents inclinations about your base's capabilities and intentions. If they believe you intend to do something you will not be doing, take advantage of their existing preconceptions rather than trying to change their mindset.

f. INITIATIVE

The CCD planner must weave a web of deception that forces the adversary to come to a wrong decision in as short a time as 3 to 4 seconds. Be proactive. Be prepared to act and take control. The overall scheme must reinforce false decision making by providing enough false information to entangle them into hesitation and indecisiveness about the intended target while diverting their attention and thought processes to a false target.

PROFICIENCY

Personnel involved in CCD efforts must understand deception doctrine and exercise CCD as a regular part of training. This will ensure proficiency when the base implements the CCD plan.

TRANSITION:

Now that you better understand the general concepts and the deception prerequisites, let's discuss how we collect and evaluate effective CCD planning data.

<p>INSTRUCTORS NOTE: USE TABLE 10-1 FROM JCCD TECH REPORT 94-1 TO SUMMARIZE THE TYPES OF DATA NECESSARY TO IDENTIFY AIR BASE CCD NEEDS.</p>

INSTRUCTORS NOTE: ATTACHMENTS 2, 3, AND 4 PROVIDE ADDITIONAL INFORMATION AND GENERAL SUGGESTIONS AND/OR GUIDELINES FOR MAIN POINT 3.
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MAIN POINT 3.

a. COLLECTING AND EVALUATING DATA

Collecting sufficient data to properly identify required CCD resources is the key factor to the success of any air base CCD plan.

b. DETERMINE THE THREAT

a. Determine the threat. Expanding on what we said earlier, CCD opposes and degrades hostile acquisition systems; therefore, we must identify, at least generically, these threat systems capabilities as completely as possible for the intelligence sources available. Organizations around the base routinely collect this information in support of their mission. Talk to wing intelligence, flying squadron intelligence, electronics warfare offices, and the air base ground defense agencies. You can glean a lot of data from sources currently in use.

PERFORMANCE RELATES TO COUNTERING THREATS

The performance we want to achieve using CCD directly relates to our capability to counter the threats sensing devices.

CONSIDER VARIOUS
ATTACK
INFORMATION

We must consider the following enemy attack information: their attack profile, possible directions from which they will attack, time of day, number of aircraft in attack wave, and numerous other factors. This information helps us calculate the enemy's ability to acquire and attack our targets successfully.

DETERMINE THREAT
USING INTELLIGENCE
ESTIMATES OF ENEMY
CAPABILITIES

We get our threat data using intelligence estimates of enemy capabilities. Just as important, we need to think in terms of training and proficiency, aircraft armament and avionics, and employment profiles.

b. ESTABLISH CCD
PLAN WITH CLEAR
GOALS

Establish a CCD plan with clearly stated goals. CCD design efforts are driven by establishing CCD goals and objectives

BEFORE BEGINNING
ASK QUESTIONS

Before beginning, ask these questions: What type of CCD equipment and techniques does the base need? Should they be immediate, short-term, or long-term goals? When should we apply the technique(s)? Should this occur in peacetime or at a particular stage or state of alert? Can the CCD be part of facility construction, or will it have to be a removable exterior treatment?

**IDENTIFY AND
ESTABLISH LIKELY
TARGETS**

As a working group of functional experts from various base agencies, identify and establish a list of likely targets. Do not presume the enemy has the same targeting priorities or will exercise the same restraint about collateral damage as do the US forces and most of our allies. Often our opponents have little concern for civilian casualties.

**SOME AREAS DON'T
CONTRIBUTE TO BASE
COMBAT CAPABILITY**

Not all facilities within the installations perimeter will sustain deliberate conventional weapon attacks. Most installations contain areas that do not contribute to the installation's combat capability such as schools, recreational facilities, etc.

**THESE FACILITIES
PROVIDE GREAT
DECOY
OPPORTUNITIES**

However, don't overlook schools, recreation centers, etc., since they are large and provide cues to the enemy on more lucrative targets. Also, these facilities usually provide us great decoy opportunities.

PRIORITIZE TARGETS

Installation features are quite complex containing runway and taxiway networks, aircraft shelters, and other areas such as command, control and communications centers, storage areas, and a re-supply system. Each of these facilities contributes to combat operations.

PRIORITIZATION FACTORS TO CONSIDER

Main operating bases (MOBs) have established priorities of each facility on the air base. However, for bare base locations, a CCD working group should prioritize the importance of each facility. Base priorities on the following and any other important factors:

- 1) Importance of the facility.
- 2) Impact of the facility's loss.
- 3) Time required for CCD treatment.
- 4) Assets required to treat.
- 5) Facility's relation to other targets.
- 6) Available alternative passive defense measures.
- 7) Correct timing of the treatment.

e. USE EXERCISE INFORMATION

As planners, we use the information gained from exercises to establish courses of action for defeating the potential threat and to better determine our resources conspicuousness. We will discuss this later in this lesson.

CONDUCT USEFUL EXERCISES

Exercise evaluation teams should conduct purposeful CCD exercises using the prioritized list as a stimulus. Having identified the targets, aircrews, intelligence personnel, and planners work to determine appropriate methods and corridors of attack and types of armament and detection systems. Do not give away the actual CCD plan to the enemy during exercises. Do not employ measures exactly as you would in an actual contingency.

f. EXAMINE AIR BASE
AND SURROUNDING
AREAS

A study of the surrounding area helps us determine which existing landmarks and reference points the enemy might use to detect a critical facility or as an orientation point.

ORIENTATION POINTS
USUALLY
ESTABLISHED -
EXAMPLES

With existing installations, as opposed to bare bases, it is usually difficult to eliminate CCD orientation features already present. These include highways, railroad tracks, road intersections, rivers, characteristic land forms, and isolated structures such as castles, towers, and bridges.

TAKE CCD INTO
CONSIDERATION TO
AVOID PROVIDING
ORIENTATION
FEATURES

For this reason, when choosing a location for new installations, installation planners should take CCD in to consideration and avoid providing the enemy orientation features. Color photos at representative attack altitudes, distances, and angles are critical to meet the needs of any CCD planner.

g. COLLECT MAPS
AND PHOTOS OF
BASE AND
SURROUNDING
AREA

Collect essential maps and photographs of the air base and surrounding area. Among those required are topographic maps, town plans, and area maps. Aeronautical charts and photo maps are also very helpful.

**BCE AND DMA CAN
PROVIDE MAPS OF
THE BASE**

Maps with a scale of not less than 1:25,000 and maps with a scale of not less than 1:50,000, help develop a complete picture of the project area. Follow all security precautions when using these maps. The Base Civil Engineer and the Defense Mapping Agency can provide maps and structural drawings to the working group, as well as assist in the area survey or base examination.

**SITE PLANS A
NECESSITY**

Site map plans are an absolute necessity. Use these to plan routes to construction areas and help identify critical facilities by their size, location, and orientation. Site plans should identify, if possible, vegetated areas such as clusters of trees or tall hedgerows.

**VISUALIZE AS IF YOU
WERE THE ENEMY**

We must be able to visualize how the site will look to enemy aircrews, satellites and other reconnaissance, or to remotely guided weapons and munitions equipped with various sensors.

**CONSIDER DECOY
SITES AND FALSE
INTELLIGENCE**

Consider integrating possible decoy sites which provide the attacker a false target and perhaps provide false intelligence in their battle damage assessment reports.

**DETERMINATION OF
CONSPICUITY OF
INSTALLATION**

Not all site elements will be equally conspicuous. For example, a runway is a large feature; however, it is most conspicuous for low-level attacks only if approached end-on, but not from the side.

**ROAD PATTERNS
NOTICEABLE ON
MAPS, NOT TO PILOTS**

Road patterns are very noticeable on maps, but may not be visible for a low-level attacker. Individual structures may be screened from view by other features such as buildings, trees, or abrupt changes in topography.

**AERIAL IMAGERY
CRITICAL TO STUDY**

Aerial imagery gives the view of an attacking aircraft and is essential to proper planning. An aerial photographic and multispectral survey flown at representative threat directions, altitudes, and distances is one critical part of the study.

**RECON PILOTS
SHOULD SURVEY IN
CLEAR WEATHER**

Without this aerial survey, it is impossible to view the facilities as the threat will. Reconnaissance pilots should accomplish surveys in clear weather for a worst-case scenario. They should view the installation from a number of approach directions at altitudes typical of those expected during attacks to determine which elements are conspicuous.

DETERMINE
RECOGNITION
FEATURES

Determine the recognition features of an installation, and list and arrange them in order of their degree of conspicuousness. An object is conspicuous if it stands out from its surroundings due to contrast, size, shape, location, and other factors.

ANALYSIS LISTS
ITEMS USED BY
ATTACKERS

The data collected should include the following items used by approaching attackers and should be considered for CCD:

- a) Cues leading to the installation
- b) Conspicuous elements for initially recognizing the installation
- c) Conspicuous priority targets
- d) Cues leading to likely targets

DETERMINATION OF
TARGET SIGNATURES

Once we collect the data on all air base facilities or areas, we must determine these element's signatures.

SIGNATURE
COMPRISES
FEATURES THAT
MAKE OBJECT
RECOGNIZABLE

A signature is the particular features or characteristics which make an object recognizable. These characteristics include shape, size, color, location, contrast, pattern, texture, thermal appearance, and probable radar cross section.

SIGNATURES WILL
DIFFER

Signatures for a target will differ with the attack direction, sensor, and profile. They will also vary according to the time of day, weather, and season.

ESTABLISH CCD
OBJECTIVES

Objectives should be set to meet the CCD goals the working group establishes.

**FORMULATE
OBJECTIVES BY
ASKING CERTAIN
QUESTIONS**

We should formulate objectives from the questions we asked earlier concerning the types of CCD equipment and techniques, their immediacy, and application.

**EVALUATE CCD
MATERIALS AND
MEASURES**

Evaluate available CCD equipment and techniques to determine alternatives which provide the greatest increase in anticipated survivability for the least cost, construction effort, and maintenance.

**CONSIDER
PERMANENT AND
EXPEDIENT METHODS**

Consider both permanent and expedient measures. Expedients, such as obscurants and camouflage screening, are applied only in the event of an alert or actual conflict. They should however, be procured and practiced in peacetime and will usually require a means for rapid employment. Also, consider the availability and transportability of the assets.

**EVALUATE CCD
AGAINST THREAT
SENSORS**

Evaluate the effectiveness of potential CCD equipment and techniques against the defined threat sensor capabilities.

**SEVERAL METHODS
AVAILABLE FOR
EVALUATING CCD
TECHNIQUES**

Several methods exist for evaluating the effectiveness of CCD techniques. These are: using analytical methods, computer modeling, and follow-up flights. Even when analytical methods and computer models are available, follow-up flights are the best choice.

MODELING TECHNIQUES

Computer modeling techniques such as the Simulation, Analysis, and Control System and the Large Area Smoke Screen model are being developed today that will enable planners to apply CCD measures on a typical air base without employing the manpower or equipment necessary to prove effectiveness. Early models may be available to planners as soon as 1997, with more sophisticated versions being fielded by the year 2000.

FOLLOW-UP FLIGHTS AND POST MISSION BRIEFING EXTREMELY IMPORTANT

Follow-up flights involve repeated flights using aerial imagery and pilots visual acquisition to determine if the applied CCD measures are effective. Aircrew post-mission briefings provide a qualitative measure of CCD effectiveness. This method results in an invaluable and realistic insight into target conspicuousness and any needs for further action.

OPERATIONAL CONSIDERATIONS

As CCD equipment and techniques are evaluated, we will develop an operational concept.

ALTER, AUGMENT, OR REPLACE CCD IF NOT REALISTIC

Alter, augment, or replace a particular piece of CCD equipment or a technique if it is not operationally realistic. We should evaluate countermeasures using these operational concepts:

- (a) How will the CCD equipment and techniques be employed - how will they be used?
- (b) Which areas or structures will receive treatment?
- (c) How much of the countermeasure is needed?
- (d) Are there sufficient human resources available to properly employ the measures?
- (e) Are CCD equipment and techniques logistically supportable?

- 1)What is the impact on supply?
- 2)Are there funding limitations?
- 3)Any additional equipment requirements?
- 4)What are the handling requirements?
- 5)How about storage requirements?
- 6)Are there any special considerations such as safety or environmental?

- (f) What other resources are required?
- (g) How much and who will supply required maintenance?
- (h) Are equipment and techniques inter operable and compatible?
- (i) Will CCD be employed as a permanent, short-term, or expedient measure?
- (j) Is the cost effectiveness of the CCD equipment and techniques comparable with other passive or active alternatives?
- (k) Is the employed CCD counter-productive to another threat wave band? For instance, visual tonedown may increase surface temperature making the target susceptible to infrared threats.

MAIN POINT 4.
PROBABLE TARGETS

Although planners consider each installation individually, there are certain targets applicable to most major Air Force installations.

PROBABLE TARGETS

According to the 1995 edition of WMP-1, Annex S, Appendix 7, Table 3 (Table S-7-3), some priority probable targets are:

- a. Unprotected aircraft
- b. Runways and taxiways
- c. Aircraft shelters
- d. Communications and analysis center
- e. Weapons storage
- f. POL storage
- g. Other logistical equipment and supplies.

**EACH ENEMY HAS
OWN TARGET SET**

As any wartime planner will tell you, each enemy has their own target set, which is a pre-planned set of targets they will attack. These are determined prior to their attack mission beginning during the mission brief.

**WILL ATTACK ANY
TARGET OF
OPPORTUNITY**

Once the enemy reaches the target area, if they determine that the target they are supposed to attack has already been hit or they simply cannot find it, they will attack any target of opportunity. They do this in most cases to keep from returning home with unexpended munitions.

**DECOYS GREAT
MUNITIONS
ABSORBERS**

Decoys such as aircraft, buildings, generators, tanks, and others fill the role as opportune targets perfectly. Because the attacker may fire on another of our untreated targets, decoys fulfill a wonderful role as munitions absorbers.

TRANSITION:

Keep in mind that the targets we spoke of are probable targets, not necessarily the targets they are guaranteed to strike. Now let's talk about conspicuity factors.

INSTRUCTORS NOTE: USE THE FIGURES IN CHAPTER 4 OF JCCD TECH REPORT 94-1 TO DEMONSTRATE CONSPICUITY FACTORS.
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**MAIN POINT 5.
CONSPICUITY
FACTORS**

Most potential targets have characteristics that help make them easily detectable among their backgrounds clutter. This is called conspicuity.

ROADS ARE GOOD ORIENTATION FEATURES

Principal features such as roadway systems may not be high priority targets, but may certainly serve as orientation points.

b. SIZE

The mere size of an object makes it easily detected. When attackers view a runway along its axis, it is the single most conspicuous feature on any air base. The large size of maintenance hangars and complexes makes them very easily seen.

c. SHAPE

The distinctive shape of certain objects quickly tells the attacker what the target is. For instance, some aircraft shelters have a distinctive semi-cylindrical shape. The large dish antenna on top of the communications/analysis center is very apparent. POL tanks are also distinctive because of their truncated cone shape or round cylinder.

d. PATTERN

Distinctive patterns identify areas to attackers. Good examples are the uniform string of weapons storage bunkers and the even spacing of the administration buildings and the warehouse. Another important point to remember is that the parallel runway and taxiway and the connecting taxiways also creates a pattern; however, these are less obvious during low-level attacks.

e. THERMAL
CONTRAST

e. Another conspicuity factor is thermal contrast. Target backgrounds are the greatest thermal contrast feature. Very large, heated, uninsulated maintenance hangars exhibit tremendous thermal contrasts with their background. Positive contrast means the object that is solar-loaded will brightly show themselves on thermal IR detectors. All south-facing manmade structures display a significant positive thermal contrast during or shortly after direct solar loading.

Materials with high thermal inertia such as hardened shelters, runways and taxiways, and the communication/analysis center, experience a time lag in solar loading. They are warmer than their background during the late afternoon and early evening but cooler in the early or midmorning period. On thermal imagers, this shows distinctly as the target shape.

NEGATIVE CONTRAST
AT NIGHT BECAUSE
OF RADIATIVE
EXCHANGE

Negative contrast is when an object appears as a black space in the shape of the object on the detector. The metal warehouse and maintenance building roof show negative contrasts on clear nights because of radiative exchange with the sky. To some degree, even the runway and taxi systems demonstrate the same behavior.

f. RADAR
REFLECTION

Attackers receive large radar returns from the metallic maintenance hangars and warehouses and from the metallic doors of aircraft shelters and weapons storage bunkers. The concrete entrance walls of the communications/analysis center form large corner reflectors with a high radar cross section value. Traffic areas show a negative contrast because of too little return.

TRANSITION:

Now let's briefly look at the non-specific measures we can take to assist your planning.

MAIN POINT 6. NON-SPECIFIC CCD MEASURES

The following recommendations are made for increasing the survivability of selected targets as well as orientation features on the air base.

MULTISPECTRAL MEASURES

Many of these measures are multispectral, providing benefits in the visual, thermal IR, and radar spectral regions. For example, forestation, earthworks, and careful use of camouflage nets can provide effective multispectral CCD measures.

a. SMOKE AND OBSCURANTS

The best method to conceal the air base from observation is by employing large-area smoke. Smoke and obscurants can provide nearly complete visual and near-IR screening and defeat most laser-guided weaponry.

**MULTISPECTRAL
SMOKE**

Once testing of products is complete, a multispectral smoke system will also provide effective thermal IR protection. If a system is truly multispectral, it would defeat visual, thermal IR, and radar threats. As yet the USAF has not purchased any system that effectively defeats radar threats in smoke and obscurants. For the future, researchers are developing obscurants that will passively affect different ranges in the radar spectrum as well.

**OPTIMUM SMOKE
TECHNIQUE IS A
BLANKET**

The optimum technique for smoke employment is a smoke blanket that covers the entire base. When employing a smoke blanket, consider using a false operating surface (FOS) to simulate a landing strip.

**HAVE FOS AT AN
ANGLE TO TAXIWAY**

Place the FOS at an angle to and distanced from the actual taxiway to confuse the attacking aircrew and cause their weapons delivery to be away from critical targets. That is, use the FOS as an enticing, but misleading and disorienting, exposed portion of the runway or primary taxiway. The use of decoy aircraft may enhance the plausibility of FOS.

MAY USE CURTAIN OF SMOKE

If meteorological conditions prohibit employment of a smoke blanket, try to employ a curtain or vertical wall of smoke between the targets and the threat. This curtain should be positioned to provide relative screening heights needed to defeat anticipated target acquisition and weapon delivery profiles.

COORDINATE WITH GROUND DEFENSE

Curtains and other smoke screens should be coordinated with ground-based air defense to minimize interference with friendly air defenses and to channel the attackers into traps.

CONSIDER LARGE DECOY SMOKES

Consider using large-area decoy smoke screens. For the best results, use multiple decoys and do not place the airfield between two decoys. Consider placing decoy targets just outside of decoy screens.

b. FORESTATION

Don't cut native trees and encourage the growth of trees wherever possible. Interact with local civilian authorities for advice on forestation and cheap or free tree saplings. These methods are long-term, maybe 10 years plus.

c. DECOY AIRCRAFT

Position a few decoy aircraft on decoy taxiways. Cover revetments with asphalt or concrete colored or luminance matching ultra-lightweight camouflage nets.

TRANSITION:

Before we begin our planning, let's wrap up our CCD measures discussion with measures for individual facilities.

MAIN POINT 7.
SPECIFIC CCD
MEASURES

Here are some ways to apply CCD to specific areas:

INSTRUCTORS NOTE: USE FIGURES 5-5 AND 5-6 FROM THE AIR BASE CCD GUIDE TO DEPICT EXTENDING FIELD PATTERNS.

a. RUNWAYS AND
TAXIWAYS

Extend the field patterns from adjacent farm lands into the areas between the runway and taxiways by using the methods of landscaping, planting, and selective grass cutting. Plant hedges along extensions of field pattern- to visually break up the road pattern. If the runway cannot be stained with different colors, tone it down with alternatives to stains.

b. TONEDOWN

Tone down distinctive shelter loop taxiways and hard stands openings with a luminance and thermal temperature that matches the dominant background.

c. NETS AND WATER

To expediently reduce thermal characteristics of taxiways and hard stands, horizontally suspend camouflage nets at least 18 inches above the distinctive connecting taxiway and hardstand surface.

PLACE STAKES,
ROPE/CORD, AND
NETS

This may be carried out by placing stakes in the ground at regular intervals along the taxiways and connecting rope or cord from one stake to another across the taxiway. Place the net on top of the cords and secure it in place. Obviously, this measure shouldn't be employed on taxiways actively in use.

TREAT SURFACE WITH
WATER TO COOL
SIGNATURE

If possible, treat surface with water continuously during sunny days. This cools and reduces the heat reflected from the surface. For visual attacks, do not allow water to form pools which act as a mirror providing a noticeable glint to the surface. Finally, any steam produced from the treatment provides no noticeable cue to an air or ground based attacker, nor will it affect detection of the target when attackers use IR sensors.

d. SHELTERS

Paint some aircraft shelters with a camouflage pattern to match the background or use camouflage nets to alter shape as well as contrast. Change the distinctive shape by pushing earth up against the shelter walls and the exhaust deflection units; then seed the earth. Plant trees between shelters similar to any indigenous forest cover and grow ivy over the shelters.

VARY PROCEDURES

Do not treat all shelters the same way but vary the procedure. Cover the door to the superstructure with radar scattering nets. Keep doors closed unless absolutely necessary.

INSTRUCTORS NOTE: USE FIGURE 5-7 OF THE AIR BASE CCD GUIDE TO DEPICT PATTERNING OF FACILITIES AND BLENDING WITH SURROUNDINGS.

e. COMMUNICATIONS
AND ANALYSIS
CENTER

Paint concrete walls with a three-color disruptive pattern. Place camouflage sails or disrupters on the large homogeneous roof. Cover the entrances with radar scattering nets as an expedient measure. At the same time, plant small trees for long-term screening all around the building and extend the planted area toward any administration buildings.

INSTRUCTORS NOTE: USE FIGURE 6-1 OF THE CCD GUIDE TO DEPICT AN EXAMPLE OF APPLYING CCD TO A WEAPONS STORAGE FACILITY.

f. WEAPONS STORAGE

Discontinue peacetime grass cutting and weed controlling on the earth-covered bunkers to encourage growth of a varied vegetation cover. On the tops of weapons storage bunkers, cut only tree saplings. This will prevent them from growing the deep tap roots that may eventually affect the strength of the bunker.

PAINT, COVER,
EXTEND

As an example, if we had eight weapons storage bunkers to apply CCD measures to, we may paint the faces and doors of three of them a light green, three of them tan, and two forest green. Cover any access roads with texture mats. Extend desert nets turned with semi-arid side facing outwards from the door tops at a very shallow angle to match surrounding grass areas. Ensure that all security police concerns are met.

g. POL STORAGE

Alter the distinctive truncated cone shape of POL bunkers with additional earth to give non-uniform shapes. Let shrubs grow on the slopes and near the bottom. Place artificial trees on tops of the bunker and make sure the trees are the non-electricity conducting types.

INSTRUCTORS NOTE: USE FIGURE 6-7 OF THE CCD GUIDE TO DEPICT CCD MEASURES FOR MAINTENANCE HANGARS.

h. MAINTENANCE
HANGARS

Insulate the interiors of maintenance hangars to reduce heat loss. Apply controlled thermal emissivity paints to the hangar walls and roof to change the thermal and visual image of a large structure into an image of several smaller structures. Cover the corners of the building which serve as radar reflectors with radar scattering nets.

i. WAREHOUSE
COMPLEX

If the warehouse complex is separated from the main base and encircled by a civilian community, maintain a civilian appearance by treating each building differently. Use bright paint colors. Do not use camouflage patterns or camouflage colors.

j. ADMINISTRATION
BUILDINGS

If administration buildings are separated from base and encircled by a civilian community, maintain the civilian appearance of an office building. Use color schemes typical for the area such as similar roofs.

TRANSITION:

We should now have a good understanding of what data must be collected and evaluated, and some of the specific and non-specific measures available. So let's get into developing the plan.

MAIN POINT 8. PLAN
DEVELOPMENT

Ideally, CCD will be part of the construction plan for any new installation and any new construction on existing bases.

**MORE ECONOMICAL
TO ADD CCD DURING
CONSTRUCTION THAN
AFTERWARDS**

It is considerably more economical to blend facilities into the surroundings and use the terrain to the best advantage during new construction on the installation than to add CCD later. We can avoid or minimize most CCD related problems if CCD is integrated during construction and not applied as a "Band-Aid" fix after the fact. The fix will not likely be as effective, and will certainly require more resources such as materials and manpower at a time when they are in short supply. If we build CCD in to the facility, no additional resources should be required in a contingency.

**a. INTEGRATE
OBSCURANTS**

Develop an integrated CCD plan that includes obscurants and consolidating individual facilities designs.

**NO STANDARD CCD
DESIGNS; CONSIDER
INDIVIDUAL TARGETS
COLLECTIVELY**

Remember, there are no standard CCD designs for any specific facilities or structures. Consider individual facility designs collectively, especially for facilities in close proximity to each other. This ensures overall compatibility and effectiveness.

**b. PLANNING GROUP
FORUM**

Develop plans in a planning group forum with knowledgeable people from the command staff, operations, intelligence, maintenance, the civil engineers, security police, safety, and any other pertinent agencies.

c. EVOLVING
THREATS

Plans must include provisions for evolving threats, seasonal changes, terrain pattern changes, and present and future uses of the installation. Additionally, the mission of the installation or activity will affect the plan for the degree of CCD effort to be expended.

d. EVALUATE CCD
SUCCESSES

Provisions for regularly evaluating the CCD successes should be part of the plan. Make preliminary evaluations on individual facilities.

SET UP TEST AREAS
FOR ASSESSMENTS

Although planning groups may gather their experiences, conduct research, and collect data, design drawings produced may not present the proposed CCD plan as the group visualized. For this reason, set up test areas for assessments where you can compare different materials and techniques to the background.

TEST DIFFERENT
TECHNIQUES OF
MATERIAL
APPLICATION

We should also test different techniques of material application for the method that will accomplish the greatest effect with least effort. Make your efforts as simple as possible. This will cut manpower and training requirements dramatically.

TRANSITION:

So far we have discussed general CCD concepts, how to collect data, and plan development. Now let's take a look at plan coordination and it's implementation.

MAIN POINT 9. PLAN
COORDINATION AND
IMPLEMENTATION

Implement the plan paying particular attention to the measures so they do not significantly affect the efficient operation of the installation or pose safety or security problems.

PROOF THE DESIGN
WILL WORK IS
OBSERVE AND
EVALUATE

The proof that the CCD design will accomplish what was intended is by observing and evaluating the results as the plan progresses. If changes must be made, coordinate them with the appropriate agencies.

WE WILL AVOID
WASTING TIME

This must be done continually from the start of the project. Doing so, we will avoid wasted time and effort resulting from unsuitable plans. Permit any needed changes in material, design, reflectance properties, or construction.

TRANSITION:

Let's discuss some implementation considerations.

a. SCHEDULING

Prepare a schedule of operations early in a CCD project. Schedule all activities without conflicts.

INSTRUCTORS NOTE: USE TABLE 10-1 OF JCCD TECH REPORT 94-1 TO DEMONSTRATE NECESSARY DATA FOR DEVELOPING AN AIR BASE CCD PLAN

**SIMPLE CHART IS
HIGHLY EFFECTIVE**

Although there are sophisticated tools for managing your project, CCD is simple and those tools are not necessary. A simple chart is highly effective and allows the correct phasing of efforts.

**SHOULD HAVE A TIME
LINE SCHEDULE**

Along with this simple chart, there should be a time line schedule and a coordinated list of the projects necessary to meet objectives. Assign completion dates and offices of primary responsibilities (OPR's) to the schedule.

b. COORDINATE**COOPERATION
IMPORTANT WITH
LOCAL CIVILIANS**

Coordinate with other AF units, units of other services, other allied armed forces, local civil defense agencies, local residents, or public utilities personnel as needed. Cooperation with the local population is especially vital if civilian landmarks will be CCD treated or removed and the treatment preserved after application. However, always remember the threat of enemy sympathizers which may destroy your best laid plans. Local landmarks would most likely receive treatment only upon imminent hostilities, and the plan should provide the techniques and who will implement them.

MAY AFFECT OTHER
INSTALLATIONS AND
HOST NATION
DEFENSES

The CCD plan executed at one nearby installation can have an adverse effect on the deception capability of other installations and should be coordinated. Also, coordinate with host country defense agencies, if applicable.

TRANSITION:

Let's discuss implementation considerations now that your CCD plan has been coordinated.

CONSTRUCTION
CONTROL

Construction control in CCD matters is essential and precludes accidentally highlighting the area as CCD treatments are being made. By this we mean that if something need not be destroyed when implementing CCD, keep it intact.

SCARRING DISCIPLINE

Discipline so as to not scar the terrain with construction equipment tracks is essential. Construction control techniques influencing CCD effectiveness is vital during all phases at any site.

ESTABLISH A TRAVEL
PLAN FOR ALL
VEHICLES

Coordinate and establish a travel plan for vehicles to prevent widespread earth scarring. Scarring is also caused by too free use of earth-moving equipment, and by excessive leveling and clearing to make construction easier.

**FOR LARGE
CLEARINGS, CUT
IRREGULAR
PATTERNS**

The clearing process is important. When a large area of woods must be cleared, as for an airstrip, trees should be cut along clearings in an irregular pattern rather than a straight line. This requires more than the minimum clearing, but the CCD impact can be substantial.

**LIMIT CLEARING FOR
BUILDINGS; AVOID
REGULAR PATTERNS**

Clearings for buildings, however, should be limited to the area to be occupied by the building. Building locations should be shifted slightly if necessary to avoid cutting down trees that will make subsequent camouflage and concealment easier. Planners must avoid placing buildings in regimental patterns.

**RESTORE DISTURBED
AREAS**

Take care to retain the overall image of the terrain and be able to restore disturbed areas after construction.

**CRITICAL AREAS
EASILY HIGHLIGHTED
BY HIGH TRAFFIC**

All personnel must be familiar with the traffic plan as it concerns their activities. Parking areas must be dispersed and concealed, and waiting points and turnarounds must be marked. Critical nodes are easily highlighted by high traffic rates. Material inspections are critical to ensure materials are those specified and that they are being correctly used or applied.

d. INSPECTIONS**CHECK COATINGS
FOR REFLECTANCE,
COLOR AND TYPE**

The paints or stains used should be checked for reflectance, color, and type.

**MATCH NETS AND
OTHER TEXTURED
MATERIALS WITH
BACKGROUND**

Nets, screens and textured materials, or similar products must be inspected before use ensuring they are properly matched as to reflectance, texture, and pattern.

**IMMEDIATELY
CORRECT IMPROPER
MATCHING**

During execution, materials must be constantly checked for suitability, quality, reflectance, color, and proper application. Immediate corrections will prevent removing and replacing material and will help keep the program on the time schedule.

**CHECK OVERALL CCD
ON THE GROUND**

Frequently check the overall program on the ground for compliance with the design. Also, look at paints and other materials to make sure the specified application is being followed.

**OPERATIONALLY
CHECK SMOKE
GENERATORS**

Inspect and maintain smoke generators and associated equipment, and comply with technical guidance. The generator with its associated rack system is very safe and effective when used in accordance with the applicable technical orders.

**e. AERIAL
MULTISPECTRAL
ANALYSIS**

We should check our efforts from the air by directly observing the multispectral imagery. Using the correct target approach techniques help to check for landmarks and reference points that may serve the attacker.

CONDUCT NIGHT INSPECTIONS

The most effective camofleurs inspect thermal images of the CCD-treated areas with night observations from the ground and air. This technique helps to quickly discover any CCD problems when thermal imaging is a threat.

PLAN VALIDATION

To evaluate the effectiveness of your CCD measures, repeat the procedures you used to determine the targets conspicuousness. Evaluate expedient measures once fully employed along with the permanent measures. After the evaluation, resolve any problems immediately.

DON'T USE EXPEDIENT MEASURES FOR LONG DURATION'S

However, we must severely limit fully employing expedient measures for periods longer than absolutely necessary. This avoids disclosing the measures to hostile observers. Many expedient measures should be employed only when access to the area is restricted and the absence of overhead reconnaissance has been confirmed.

DO NOT DISCLOSE SMOKE GENERATOR CAPABILITY

For example, do not disclose our smoke generator capability. The number of generators, obscurant types, generator locations, and employment concepts should be close-hold information.

TRANSITION:

These are all important considerations to coordinate and implement your plan. Now let's take a look at an example CCD plan.

INSTRUCTORS NOTE: USE APPENDIX A OF JCCD TECH REPORT 94-1 AS WALK-THROUGH EXERCISE ON AIR BASE CCD PLANNING. USE TABLE B-2 TO ASK APPROPRIATE QUESTIONS DURING THE EXERCISE.

CONCLUSION

SUMMARY:

Today we have discussed:

- CCD concepts and deception prerequisites
- How to collect and evaluate data
- Probable targets and their conspicuousness
- Specific and non-specific CCD measures
- How to develop, coordinate, and implement CCD plans

REMOTIVATION:

Today we have discussed:

- CCD concepts and deception prerequisites
- How to collect and evaluate data
- Probable targets and their conspicuousness
- Specific and non-specific CCD measures
- How to develop, coordinate, and implement CCD plans

CLOSURE:

That concludes the lesson on CCD planning and implementation.

TRANSITION:

(Develop locally to transition to the next topic.)

PART III
EVALUATION

STUDENT PERFORMANCE STANDARDS

TEST ITEMS

1. LESSON OBJECTIVE: Identify CCD design priorities.

QUESTION: (Multiple Choice) Which of the following are the two CCD design priorities to meet the design goal of controlling the threats effectiveness and providing our desired level of survivability?

- a. Concerted and properly managed.
- b. Consider reduced conspicuousness and survivability.
- c. Goals are met using the least funding, and manpower necessary.
- d. Protect the most critical targets, cues, and large, conspicuous features.

Key: d.

Reference: Main Point 1

2. LESSON OBJECTIVE: Identify necessary data to be collected for a successful CCD plan.

QUESTION: (Multiple Choice) What data must be collected to ensure the success of any air base CCD plan to counter threat sensing devices?

- a. Attack profiles, directions, and armament.
- b. Number of aircraft in the attack wave, pilot training, and proficiency.
- c. Time of the attack during the day, employment profiles, and avionics.
- d. All of the above.

Key: d.

Reference: Main Point 3

3. LESSON OBJECTIVE: Identify proper CCD construction planning techniques.

QUESTION: (True or False) It is more economical to “Band-Aid” fix CCD problems with expedient measures than to blend targets into surroundings during installation construction?

- a. True
- b. False

Key: b.

Reference: Main Point 8

4. LESSON OBJECTIVE: Identify CCD plan implementation and coordination considerations.

QUESTION: Which of the following must be considered in implementing and coordinating a base CCD plan?

- a. The operation of the installation must naturally work around CCD plan implementation.
- b. Make all units and personnel aware of expedient CCD measures capabilities to ensure their cooperation.
- c. CCD plans of one installation may adversely affect the deception capability of another nearby installation.
- d. Implement material inspections only after the conflict has begun as part of the plan validation.

Key: c.

Reference: Main Point 9

5. LESSON OBJECTIVE: Identify probable air base targets.

QUESTION: As any wartime planner will tell you, each enemy has their own target set. However, for deliberate planning purposes, which of the following are generally considered probable priority targets for enemy attackers?

- a. Aircraft and personnel shelters.
- b. Weapons and logistical equipment storage areas.
- c. Communications/analysis and unit control centers.
- d. POL and fresh water supply storage.

Key: b

Reference: Main Point 4

6. LESSON OBJECTIVE: Identify factors of conspicuousness for potential targets.

QUESTION: Most potential targets have characteristics that help make them easily detectable among their background clutter. Identify which of the following factors increase a targets conspicuousness.

- a. Size and shape.
- b. Radar reflection and solar loading.
- c. Pattern and negative thermal contrast.
- d. All of the above.

Key: d

Reference: Main Point 5

7. LESSON OBJECTIVE: Determine correct use of specific CCD applications.

QUESTION: Which of the following is the correct way to apply CCD to a specific area?

- a. Berm with earth POL storage tanks and plant shrubs on the sides and place non-conducting artificial trees on the top.
- b. After pushing dirt up against and on top of aircraft shelters, plant trees on top to blend it into the surrounding terrain.
- c. Treat all aircraft shelters and munitions bunkers in the same manner to achieve a uniform appearance of obscuration throughout priority target locations.
- d. Extend surrounding farmlands into the runways and taxiways to deceive the enemy into believing the runway is much smaller than they previously believed.

Key: a

Reference: Main Point 7

PART IV
RELATED MATERIALS

1. All K-block RTPs

TRAINING PACKAGE COMMENT REPORT

RTP # _____

RTP DATE: _____

For an *immediate response* to your questions concerning subject matter in this Readiness Training Package (RTP), contact the Office of Primary Responsibility(OPR)TSgt Ron Childs of the Contingency Training Section at DSN 523-6458 between 0700-1600 (CT), Monday through Friday. Otherwise, write, fax, or E-mail the OPR to make comments, suggestions, or point out technical errors in the areas of: references, body information, performance standards, test questions, and attachments.

NOTE: Do not use the Suggestion Program to submit corrections for printing or typographical errors.

Comments: _____

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